CLAIMS

We claim:

1. Apparatus for blow molding containers from a thermoplastic material, said apparatus comprising:

an extruder for continuously extruding at least one tube of the thermoplastic material downwardly along a vertical axis;

a first mold, said first mold having a first set of mold halves than open and close relative to each other to define, when closed, a first mold cavity;

a second mold, said second mold having a second set of mold halves that open and close relative to each other to define, when closed, a second mold cavity;

means for moving said first mold along a first closed path to present said first mold at a first position to engage, when open, a first finite length of the thermoplastic tube for blowing of the first finite length of the thermoplastic tube into a container as the first mold moves from the first position to a second position of the first closed path; and

means for moving said second mold along a second closed path to present said second mold at the first position to engage, while open, a second finite length of the thermoplastic tube into a container as the second mold moves along the second closed path to the second position;

the first position of the first closed path and the first position of the second closed path being the same, and the second position of the first closed path and the second position of the second closed path being the same, said apparatus comprising no more than two molds.

2. Apparatus for blow molding containers from a thermoplastic material, said apparatus comprising:

an extruder for continuously extruding at least one tube of the thermoplastic material downwardly along a vertical axis;

a first mold, said first mold having a first set of mold halves that open and close relative to each other to define, when closed, a first mold cavity;

a second mold, said second mold having a second set of mold halves that open and close relative to each other to define, when closed, a second mold cavity;

means for moving said first mold along a first closed path to present said first mold at a first position to engage, when open, a first finite length of the thermoplastic tube for blowing of the first finite length of the thermoplastic tube into a container as the first mold moves from the first position to a second position of the first closed path;

means for moving said second mold along a second closed path to present said second mold at the first position to engage, while open, a second finite length of the thermoplastic tube for blowing the second finite length of the thermoplastic tube into a container as the second mold moves along the second closed path to the second position;

the first position of the first closed path and the first position of the second closed path being the same, and the second position of the first closed path and the second position of the second closed path being the same; and

a single in-mold labelling device positioned beneath the extruder to introduce labels into the first and second molds as the first and second molds proceed along the first closed path and the second closed path, respectively.

3. Apparatus according to claim 1 and further comprising:

a single container take-out device for successively removing blown containers from the first mold and the second mold at the second position.

4. Apparatus according to claim 3 wherein:

the second position is horizontally spaced from the first position.

5. Apparatus according to claim 4 wherein:

the second position and the first position are at the same elevation.

6. Apparatus according to claim 1 wherein:

the first closed path includes a first leg extending outwardly in a first direction and downwardly from the first position; and

the second closed path includes a first leg extending outwardly in a direction opposed to the direction of the first leg of the first closed path and downwardly.

7. Apparatus according to claim 2 and further comprising:

a single container take-out device for successively removing blown containers from the first mold and the second mold at the second position.

8. Apparatus according to claim 7 wherein:

the second position is horizontally spaced from the first position.

9. Apparatus according to claim 8 wherein:

the second position and the first position are at the same elevation.

10. Apparatus according to claim 2 wherein:

the first closed path includes a first leg extending outwardly in a first direction and downwardly from the first position; and

the second closed path includes a first leg extending outwardly in a direction opposed to the direction of the first leg of the first closed path and downwardly.

11. A method of blow molding containers from a thermoplastic material, the method comprising:

substantially continuously extruding a thermoplastic material downwardly a vertical axis;

engaging a first finite length of the thermoplastic material in a first mold set at a first position of the first mold set;

moving the first mold set in a closed path having a first leg in which the first mold set is moved from the first position upwardly in a first direction and downwardly;

engaging a second finite length of the extruded thermoplastic material in a second mold at the position where the first finite length of the extruded thermoplastic material was engaged by the first mold set after the first mold set has moved along the first leg of its first closed path;

moving the second mold set along a second closed path having a first leg extending outwardly in a second direction from the first position and downwardly, the second direction being opposed to the first direction;

removing the blown containers from the first mold set at a second position of the second closed path, the second position being spaced horizontally away from the first position; and

thereafter removing the blown containers from the second mold set at a second position of the second mold set, the second position of the second mold set being the same as the second position of the first mold set;

the method comprising using no more than two molds.

12. A method of blow molding containers from a thermoplastic material, the method comprising:

substantially continuously extruding a thermoplastic material downwardly a vertical axis;

engaging a first finite length of the thermoplastic material in a first mold set a first position of the first mold set;

moving the first mold set in a closed path having a first in which the first mold set is moved from the first position upwardly in a first direction and downwardly;

engaging a second finite length of the extruded thermoplastic material in a second mold at the position where the first finite length of the extruded thermoplastic material was engaged by the first mold set after the first mold set has moved along the first leg of its first closed path;

moving the second mold set along a second closed path having a first leg extending outwardly in a second direction from the first position and downwardly, the second direction being opposed to the first direction;

removing the blown containers from the first mold set at a second position of the second closed path, the second position being spaced horizontally away from the first position;

thereafter removing the blown containers from the second mold set at a second position of the second mold set, the second position of the second mold set being the same as the second position of the first mold set; and

applying labels, in sequence, to interiors of the first mold set and the second mold set, the labels being applied to the interiors of the first mold set at the first position of the first mold set and being applied to the interiors of the second mold set at the first position of the second mold set.

13. Apparatus for blow molding containers from a thermoplastic material, said apparatus comprising:

an extruder for continuously extruding at least one tube of the thermoplastic material downwardly along a vertical axis;

a first mold, said first mold having a first set of mold halves that open and close relative to each other to define, when closed, a first mold cavity;

a second mold, said second mold having a second set of mold halves that open and close relative to each other to define, when closed, a second mold cavity;

means for moving said first mold along a first closed path to present said first mold at a first position to engage, when open, a first finite length of the thermoplastic tube for blowing of the first finite length of the thermoplastic tube into a container as the first mold moves from the first position to a second position of the first closed path;

means for moving said second mold along a second closed path to present said second mold at the first position to engage, while open, a second finite length of the thermoplastic tube for blowing the second finite length of the thermoplastic tube into a container as the second mold moves along the second closed path to the second position;

the first position of the first closed path and the first position of the second closed path being the same, and the second position of the first closed path and the second position of the second closed path being the same; and

means separate from the first mold set and the second mold set for grasping the extruded tube and for moving downwardly before a finite length of the extruded thermoplastic tube is grasped by the first mold set or the second mold set, the means for grasping releasing the extruded thermoplastic tube and withdrawing from the thermoplastic tube after the finite length of the thermoplastic tube has been grasped by the first mold set or the second mold set.

14. A method of blow molding containers from a thermoplastic material, the method comprising;

substantially continuously extruding a thermoplastic material downwardly a vertical axis;

engaging a first finite length of the thermoplastic material in a first mold set at a first position of the first mold set;

moving the first mold set in a closed path having a first leg in which the first mold set is moved from the first position upwardly in a first direction and downwardly;

engaging a second finite length of the extruded thermoplastic material in a second mold at the position where the first finite length of the extruded thermoplastic material was engaged by the first mold set after the first mold set has moved along the first leg of its first closed path;

moving the second mold set along a second closed path having a first leg extending outwardly in a second direction from the first position and downwardly, the second direction being opposed to the first direction;

removing the blown containers from the first mold set at a second position of the second closed path, the second position being spaced horizontally away from the first position; and

thereafter removing the blown containers from the second mold set at a second position of the second mold set, the second position of the second mold set being the same as the second position of the first mold set;

grasping the extruded thermoplastic tube by a device separate from the first mold means and the second mold means and before the first finite length of the thermoplastic tube or the second finite lengths of thermoplastic tube is grasped by the first mold means or the second mold means;

moving the device downwardly;

grasping the first finite length of the thermoplastic tube or the second finite lengths of the thermoplastic tube while it is engaged by the device;

releasing the thermoplastic tube by the device; and

withdrawing the device from the thermoplastic tube to permit the first finite length of the thermoplastic tube in the first mold means or the second finite length of thermoplastic tube in the second mold means, as the case may be, to move along the first closed path or the second closed path.